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THIRTY POISONOUS PLANTS

OF

THE UNITED STATES.

BY

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF BOTANY,
Washington, D. C., October 31, 1898.

SIR: I have the honor to submit herewith for publication as a Farmers' Bulletin a manuscript by Mr. V. K. Chesnut, assistant botanist, entitled Thirty Poisonous Plants of the United States. In July, 1898, the Division of Botany issued as Bulletin No. 20 a report by Mr. Chesnut entitled Principal Poisonous Plants of the United States. The publication of that bulletin, however, instead of satisfying the demand for information on poisonous plants has increased it, and in order to supply the innumerable requests received since its appearance, it has seemed desirable to republish the information which it contained, in a condensed, less expensive, and more popular form. In the present publication several of the less important poisonous plants have been stricken out, while only a small amount of new matter has been added. Physiological, botanical, and chemical technicalities have been omitted, as well as most of the matter relating to remedies. The omission of remedies has been due to the difficulty of imparting exact knowledge of this subject in sufficiently condensed form, and especially to a desire to avoid the danger involved in the application, by inexperienced persons, of remedies which themselves might be fatally poisonous if improperly used. Only under the most desperate circumstances should such remedies be administered by anyone except a physician.

Respectfully,

FREDERICK V. COVILLE, *Botanist.*

Hon. JAMES WILSON, *Secretary.*

CONTENTS.

THIRTY POISONOUS PLANTS OF THE UNITED STATES.

INTRODUCTION.

In view of the frequent complaints made by farmers and others against various plants as poisonous to man and to animals, it is surprising that no illustrated account has been published of our harmful native species in such form as to be readily accessible to those who are most likely to suffer from their effects.

Statistics in regard to poisonous plants are lacking on account of a general ignorance of the subject, and it is therefore impossible to form even an approximate estimate of the amount of damage done by them. The various species of water hemlock (Cicuta) kill a number of children each year. In the State of New Jersey two quadruple cases of water hemlock poisoning were reported during the spring of 1896, which resulted fatally to two of the eight individuals affected. The number of cattle killed by one species of Cicuta in Oregon alone is estimated to be over 100 per annum. The damage caused by the well-known loco weed in Colorado was so large that the State paid out nearly $200,000 in bounties in an effort, unfortunately ineffectual, to exterminate the pest. The distress caused by poison ivy is being constantly experienced by thousands of individuals.

The Division of Botany has for the last three years been collecting general and specific information concerning poisonous plants, both from general works and special articles and by experimental investigation. From a more recent date investigations have been made of cases of poisoning which have been reported in the newspapers or by the regular correspondents and friends of the Division. By communicating with the physicians who had charge of each case, accurate and full data were obtained with regard to many plants.

All poisonous plants are not equally injurious to all persons, nor to all forms of life. The most familiar illustration of this fact is to be found in the action of poison ivy. It has no apparent external effect upon animals, and a few of them, such as the horse, mule, and goat, eat its leaves with impunity. It acts upon the skins of a majority of persons, but with varying intensity. Many people are probably wholly immune, but some lose their resistant power in middle life; others have been known to attain immunity from it to a very considerable degree. There is a similar variability in the effects of poisonous plants taken

internally. The qualifications involved in the definition of a poisonous plant are numerous, and can not well be introduced into this report. It may suffice here to say that death in some cases is attributable not to any poison which the plant contains, but to immoderate or incautious eating, or to mechanical injury, such as is produced in horses by the hairs of crimson clover, which under certain conditions accumulate in large balls and obstruct the intestines, or to the effect of parasitic growths, such as ergot occurring on rye. Neither the clover nor the rye is poisonous.

Excluding all that operate in these ways, there is still a large number of poisonous plants which, on account of their limited area of growth, and sometimes of the uncertainty of our knowledge concerning their evil effects, are comparatively little known. In the present bulletin, however, it is possible to consider only those which are well known to be poisonous.

FLY AMANITA.

Amanita muscaria (L.) Fr.

Other names: Fly fungus; fly agaric; fly killer; deadly amanita; false orange amanita. (Fig. 1.)

Description.—The amanitas form the most typical genus of that group of fleshy fungi which bear radiating plates or gills on the under surface of the cap. In the early stages of growth the amanitas are egg-shaped and are entirely enveloped by a white fleecy or cobwebby covering, which is ruptured as the stem lengthens. In a few species this covering adheres in loose, corky patches to the top of the cap, as seen in fig. 1, but sometimes it slips away from the cap entirely and forms a more or less continuous sheathing cup at the base of the stem, as shown in fig. 2. This fleecy covering and the invariably bulbous base of the stem are the most important characteristics of the genus, while the varying appearance of the former after rupture helps to distinguish the species. These features are well pronounced as a rule, but sometimes it requires some searching to find the cup.

Besides the general envelope there is also a secondary one, which at first covers the gills, extending from the stem outward in all directions horizontally to the rim of the cap. This breaks away from the cap before maturity and frequently forms a conspicuous collar about the upper part of the stem. The spores, and usually the gills also, are white.

The fly amanita is a handsome, robust species, 4 to 16 inches high. It is singularly free from larval pests and the usual signs of decay, and is highly attractive in appearance, taste, and smell. In its early stages the shape of the cap is very strongly convex, but by gradual expansion it becomes flat and even concave. It is invariably warty. In color it varies from nearly white through all shades of yellow to a bright red. As a rule, it is more reddish in the center and light yellow

outward, but sometimes the color is uniform throughout. The enlarged base is marked with short, stubby projections of the skin, which are generally replaced upward along the lower part of the stem by soft, flexible shavings, as seen in the figure. The general shape of the plant is very much like that of the orange amanita (*Amanita caesarea*), but it differs conspicuously in the absence of a cup and in the possession of white instead of yellow gills and stems. It differs also in usually having a warty instead of a smooth cap. Both grow in pine and oak forests from spring to autumn, but the edible species does not



FIG. 1.—Fly amanita (*Amanita muscaria*): *a*, mature plant; *b*, top view of cap, showing corky patches—both one-half natural size.

appear so late in the autumn as the other. From the common mushroom (*Agaricus campestris*) the fly amanita is easily distinguished by having white instead of purple gills and spores, by its warty cap and bulbous stem, and by its place of growth—the meadow mushroom never appearing in forests. The fly amanita is abundant in several localities in the United States.

Poisonous character.—It is the best known of all the poisonous species. As a fly poison it has been used in Europe for hundreds of years, and the origin of its use in northeastern Asia as an intoxicant is probably

not much more modern. Poisoning is, however, not so frequently caused by it as by the closely related and more poisonous death cup (*Amanita phalloides*), yet many cases have been recorded. Cattle are poisoned as well as men, and it is supposed that their flesh is thus rendered unwholesome.

Symptoms of poisoning.—The symptoms come on generally within two hours after the fungus is eaten, and consist in a less rapid beating of the heart and an extreme difficulty in breathing. After two or three hours there is a profound stupor, often preceded or accompanied by cold sweats and nervous phenomena—such as giddiness, double vision, and lockjaw. Vomiting sometimes gives relief to the patient, but it is often difficult to produce this effect after stupor has set in, even with the most powerful emetics. This condition may last from eight to ten hours in milder cases, and one or two days in more serious cases. Death follows in from eighteen hours to two or three days, from a gradual weakening and a final stoppage of the heart's action.

There is very little danger of finding either the fly amanita or the death cup (a description of which follows) mixed with the meadow mushrooms sold by regular dealers or brought into market by people who make it a business to do so, but diligence should be maintained by market inspectors in scrutinizing all new kinds of fungi brought in for general sale.

DEATH CUP.

Amanita phalloides (L.) Fr.

Other names: Poison amanita; bulbous amanita. (Fig. 2.)

Description and where found.—This is not so large or brightly colored as the fly amanita, but is nevertheless decidedly attractive to the inexperienced and experimenting epicure. When fresh it has neither a disagreeable odor nor taste, nor has it any ill appearance due to the presence of larvæ. It grows from 3 to 6 or 8 inches high, and has a smooth, satiny cap, which is strongly convex at first, finally becoming flat or slightly concave. It is usually white or straw-colored, but may be green, light brown, yellow, or even spotted when found growing in dense shade. The stem is white and nearly smooth. The covering present in the fungus when young almost invariably slips away from the cap in this species at maturity and forms a more or less conspicuous cup at the base of the stem, as shown in figure 2. In dry weather it sometimes partially adheres to the cap. The cup is, however, invariably present. In connection with the white gills and spores and the bulbous base, it is the distinguishing feature of the species. In general shape the death cup is somewhat like the common mushroom, but it is very much more like another species, the smooth lepiota (*Lepiota naucina*), which is considerably sought after by expert epicures. The lepiota, like the death cup, has a smooth, satiny cap, white gills, and white spores, but it is distinguished by the absence of a sheathing cup and by the ball-and-socket attachment of the stem to the cap, as well

as by its occurrence chiefly in meadows. From the common mushroom the death cup may be at once distinguished by its cup, by its white gills and spores, and by its growing in woods instead of in meadows. The death cup is the most poisonous of all the fleshy fungi. It is found usually in pine forests, where it often grows in greater abundance than any other species of fungus. Sometimes, however, it encroaches upon lawns near the borders of woods. The plant is recorded as growing in California and in various parts of the Eastern and Middle States. In the vicinity of Washington, D. C., it is exceedingly abundant in late autumn.

Poisonous character.—A large number of cases of poisoning have been attributed to this fungus in ancient as well as in modern times. In most of them the plant was taken to be an edible fungus. In a few instances the mere handling of the plant caused serious trouble. A third part of an uncooked medium-sized cap proved fatal to a boy 12 years of age.



FIG. 2.—Death cup (*Amanita phalloides*), one-half natural size.

The symptoms are characteristic; no bad taste warns the victim, and usually the first effects do not appear until from nine to fourteen hours after eating. There is then considerable pain, and there may be cramps in the legs and other nervous phenomena, such as convulsions and even lockjaw. In a few cases there are spasms. The pulse is weak and either quick or slow in its action. The pupils of the eyes are sometimes dilated. The abdominal pain is rapidly followed by nausea, vomiting, and extreme diarrhea, the discharges assuming the peculiar "rice water" condition characteristic of cholera. The latter symptoms are persistently maintained, generally without loss of consciousness, until death ensues, as it does in from two to four days.

The vernal amanita or destroying angel (*Amanita verna*) is regarded by some experts as identical with the death cup. It has the same poisonous action.

AMERICAN FALSE HELLEBORE.

Veratrum viride Ait.

Other names: American white hellebore; white hellebore; false hellebore; swamp hellebore; Indian poke; meadow poke; poke root (in N. H.); Indian uncus; puppet root; earth gall; crow poison; devil's bite; duckretter; itch weed; bugbane; wolfsbane; bear corn. (Fig. 3.)

Description and where found.—A stout, herbaceous, simple-stemmed perennial, 2 to 7 feet high, with a fleshy root 1 to 3 inches long, large

plaited stemless leaves of varying size, and a large, loose, terminal cluster of yellowish-green flowers which blossom from May to July. The plant is native to the United States, where it grows abundantly in wet meadows and along mountain brooks throughout New England; southward in cold localities through New York and Delaware to Virginia, and in the Alleghany Mountains to Georgia; westward in northern Wisconsin, the mountains of Oregon, Washington, and Idaho, and in Alaska.



FIG. 3.—False hellebore (*Veratrum viride*), one-third natural size.

Poisonous character.—Cases arise mainly from overdoses in medicine, but instances of accidental poisoning are reported for man and for various animals and birds. The seeds have been specially mentioned as poisonous to chickens. Some animals, such as the horse, are poisoned by eating the leaves, but animals such as the sheep and elk, which chew the cud, seem to relish the plant, and eat it with apparent impunity. The root has been eaten with fatal results by human individuals. One instance is recorded where all the members of a household were poisoned by eating the young leaves, which were mistaken for those of marsh marigold (*Caltha palustris*) and prepared for food.

The poison operates chiefly against the action of the heart and spinal cord, both of which it tends to paralyze. It has also a violent, although somewhat tardy, emetic and cathartic effect, a property which is often effective in expelling the poison from the system before it accomplishes its deadly work.

Symptoms.—The chief effects on the system are burning in the throat, an increased flow of saliva, defective vision, vomiting, diarrhea, severe headache, dizziness, weak pulse, labored breathing, and profound prostration. Death is caused by paralysis of the heart.

POKEWEED.

Phytolacca decandra L.

Other names: Poke; poke root; garget; pigeon berry; cocum; jalap; skoke; American nightshade; crowberry; cancer root; chongras (La.); redweed; red-ink plant; pocan bush. (Fig. 4.)

Description and where found.—A smooth, rank, succulent perennial, 6 to 9 feet high, with a thick half-woody root, purplish stems, large alternate leaves, and numerous elongated clusters of small greenish-white flowers, which blossom throughout the summer, and are followed in autumn by shining purple-black berries. The plant is native to the United States, and grows in rich, moist soils, especially as a weed in cultivated and waste grounds, from Maine and northern Illinois to Florida, and westward to Texas, eastern Kansas, and southern Minnesota.



FIG. 4.—Pokeweed (*Phytolacca decandra*), one-half natural size.

Uses.—The pokeweed is a well-known plant and has many household uses, but some chemical or mechanical manipulation seems necessary to prevent ill effects when it is eaten. The root and the alcoholic extract of the fruit are quite commonly used as a household remedy for the itch and other skin diseases and for rheumatism. The fresh shoots are rather widely esteemed as a substitute for asparagus, but in the preparation considerable care is exercised to reject the root, for small quantities impart a bitter taste to the mess, and larger amounts will prove dangerous. The water in which the shoots are first boiled is also rejected on account of the poisonous substance contained in it.

The flesh of the berries is eaten with impunity by some birds, but its use by human beings can not be recommended.

Poisonous character.—Most instances of poisoning arise from overdoses when the plant has been used as a medicine, but there are also accidental cases due to the eating of the root, which has been variously mistaken for that of the parsnip, artichoke, and horse-radish. A few fatal cases of poisoning of children have been attributed to the fruit, but whether death was really due to the seed or the pulp is somewhat uncertain. The evidence is chiefly against the seed, for it is known to contain a poisonous substance.

Pokeweed is a violent but slow-acting emetic, vomiting beginning only after about two hours. It also affects the nerves and muscles, producing retching, spasms, severe purging, and sometimes convulsions. Death is apparently due to the paralysis of the respiratory organs.



FIG. 5.—Corn cockle (*Agrostemma githago*): *a*, sprays showing flowers and seed capsule, one-third natural size; *b*, seed, natural size; *b'*, seed, four times natural size.

CORN COCKLE.

Agrostemma githago L.

Other names: Cockle; rose campion; bastard nigelle; old maid's pink (N. H.); mullein pink (Nova Scotia); licheta (Vt.); crown of the field. (Fig. 5.)

Description and where found.—A whitish, woolly annual, 1 to 3 feet high, with an erect stem, showy, violet-red flowers, and numerous rough, black, irregularly rounded seeds.

The corn cockle is a noxious weed in Europe, and in the United States it is now generally introduced in grain fields from Maine to North Dakota, southward through eastern Kansas to Louisiana and Florida; sparingly in Wyoming and California, and scarcely at all in the dry regions extending eastward from California to Texas and eastern Kansas.

Poisonous character.—The poisonous constituent is very freely soluble in water, and possesses a sharp, burning taste. It has no odor, but when inhaled in the smallest quantity it produces violent sneezing. When briskly shaken with water it froths like soap. The poison is

found in nearly all parts of the plant, but mainly in the kernel of the seed.

Ways of poisoning.—Cases of poisoning have been noted among all sorts of poultry and household animals, but are rarely due to any portion of the plant as found growing in the field. The poisoning is generally produced by a poor grade of flour made from wheat containing cockle seeds. Machinery is used to remove these seeds from the wheat, but the difficulty of separating them is so great that the result is not entirely accomplished. The quantity remaining determines the grade of the flour in this particular regard. In European countries it sometimes amounts to 30 or 40 per cent, but this quality is sent out only by ignorant or unscrupulous dealers, or is intended for consumption by animals only. Flour containing a smaller amount has often been made into bread and eaten, sometimes with fatal results, the baking not always being sufficient to decompose the poison. The effect may be acute, or, if a small quantity of the meal is eaten regularly, it may be chronic. In the latter case it is sometimes known as a disease under the name of "githagism."

Symptoms.—The general symptoms of acute poisoning are the following: Intense irritation of the whole digestive tract, vomiting, headache, nausea, vertigo, diarrhea, hot skin, sharp pains in the spine, difficult locomotion, and depressed breathing. Stupor sometimes sets in, and it may be followed by death. Chronic poisoning has not been closely studied in man, but experiments upon animals show chronic diarrhea and gradual depression, the animal losing vigor in breathing and in muscular movements until death ensues.

Corn cockle meal is easily detected in second and third class flour by the presence of the black, roughened scales of the seed coat. These are sure to occur if the flour has not been well bolted. Its presence is otherwise detected by the peculiar odor produced when the meal is moistened, and by chemical tests with iodine.

Wheat containing corn cockle seeds should be rejected for planting.

DWARF LARKSPUR.

Delphinium tricorne Michx.

Other name: Stagger-weed (Ohio). (Fig. 6.)

Description.—The genus Delphinium, formed by the larkspurs, is composed of erect herbs, with palmately lobed leaves, and an elongated cluster of showy flowers. These are commonly blue, and are further characterized by the absence of green parts, and the presence of a peculiar spur-like appendage.

There are over 25 species native to the United States. Few have a very wide distribution, but some of the Western species are extremely abundant in their natural place of growth. They have a general reputation of being poisonous to cattle.

The dwarf larkspur is a smooth, simple-stemmed perennial, 6 to 12 inches high, with a tuberous root, deeply 5-parted leaves, and a long, loose cluster of blue (sometimes white) flowers, which appear in April and May. It grows in clayey soil and open woods, from Pennsylvania and the mountains of North Carolina to southern Minnesota. It is especially reported from Ohio as fatal to cattle in April, when the fresh leaves appear.



FIG. 6.—Dwarf larkspur (*Delphinium tricorne*), one-third natural size.

WYOMING LARKSPUR.

Delphinum geyeri Greene.

Other name: Poison weed.

Description and where found.—A somewhat hairy perennial, 10 to 20 inches high, with a large spheroidal tuft of rather thick, dull-green leaves, and a central column of deep azure-blue flowers. A common high prairie plant of Wyoming and northern Colorado. It is reported to be the most troublesome of the poisonous plants of Wyoming. Ranchmen suffer considerable loss from it, especially in early spring, when the dark-green tufts of foliage are conspicuous features of the otherwise dry and barren landscape.

PURPLE LARKSPUR.

Delphinium menziesii DC.

Description and where found.—A somewhat hairy, tuberous-rooted perennial, about a foot high, with a basal cluster of finely divided, long-stemmed leaves, and a single column of showy blue flowers, which appear at any time between April and July. The flowers are few in number, but are extra large, being from 1 to 1½ inches broad. This species is found native on hillsides from the vicinity of San Francisco to British Columbia and eastward as far as South Dakota. In Montana it is very common throughout the State.

Poisonous character.—The percentage of fatal cases in cattle which have eaten this and other larkspurs is said to be small. A rough estimate by a cattleman places it at about 20 per cent for one species of the group, when the animals are not properly treated, and 5 per cent otherwise. This is probably a low estimate, however, for in a case of poisoning from *D. menziesii* that occurred in Montana in May, 1897,

and was reported by Dr. E. V. Wilcox, nearly 600 sheep were affected, 250 of which died.*

It is an excellent precaution to allow animals in pastures containing larkspur only when well fed, and then only for short periods, until they become thoroughly familiar with the deleterious nature of the plants.

The tall mountain larkspur (*Delphinium trolliifolium*), sometimes known as cow poison, grows in moist, shady places from Monterey, Cal., to British Columbia. Reports of poisoning come from California and Oregon. The poisonous qualities of this species have, however, been considerably questioned.

A lavender-colored, fleshy-rooted larkspur (*Delphinium recurvatum*) which grows in moist saline soils south of San Francisco and Stockton, in California, is particularly reported as fatal to animals in San Luis Obispo County.

The seed of the European stavesacre (*Delphinium staphisagria*) has long been regarded as a powerful poison. The seed of the commonly introduced larkspur (*D. consolida*) is regarded as less poisonous; the leaf is reputed to be poisonous to cattle in Europe. The leaf of the stavesacre has only recently been shown to be poisonous. The properties of the roots of these and other species are not well known. Little or no attention has yet been paid by American chemists to the native larkspurs, hence it is not known how poisonous they are in comparison with European.

BLACK CHERRY.

Prunus serotina Ehrh.

Other names: Wild black cherry; wild cherry; rum cherry; whisky cherry. (Fig. 7.)

Description and where found.—A valuable forest tree, 60 to 80 feet high, with thin, reddish-brown, scaly bark, tapering, saw-edged leaves, cylindrical clusters of small white flowers appearing in April and May, and shining-black, edible fruit, about a quarter of an inch in diameter. It grows abundantly in forests in the Middle Atlantic and Ohio River States; less commonly in woods and in the open country in the southern New England and Gulf States, and westward from Illinois to South Dakota, eastern Nebraska, and Arkansas. As an ornamental and shade tree it is cultivated extensively in Wyoming and Colorado, and eastward to the Atlantic.

Fruit.—The fruit is rather agreeable, being but slightly bitter and astringent in taste. In some localities it is much used to flavor liquor.

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* Since the above was in press, Dr. S. B. Nelson, Professor of Veterinary Sciences in the Washington State Agricultural College, has published (Bull. No. 22, Bureau of Animal Industry, U. S. Department of Agriculture) the results of an experiment made by himself, in which as much as 24¾ pounds of the fresh leaves of this plant was fed to a sheep within a period of five days without any apparent ill effect. An experiment made by Dr. Wilcox (Bull. No. 15, Montana Agricultural Experiment Station) shows that the extract from less than an ounce of the dried leaves killed a yearling lamb in two hours, the dose having been given by way of the mouth.

Ways of poisoning.—Poisoning is frequently caused in cattle by eating the wilted leaves from branches thrown carelessly within their reach or ignorantly offered as food. Children occasionally die from eating the kernels of the seed or from swallowing the fruit whole.

Symptoms.—The prominent symptoms of black-cherry poisoning observed in cattle are labored breathing, diminished pulse, numbness, protruding eyeballs, convulsions, and death from paralysis of the lungs. In some cases there is considerable frothing at the mouth; in all there is a very perceptible odor of prussic acid in the breath.

The freshly cut branches of the trees should in no case be thrown where cattle can get at them.

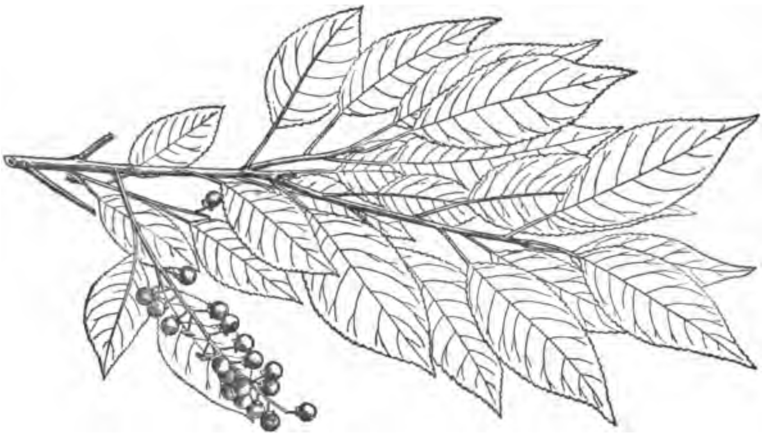


FIG. 7.—Black cherry (*Prunus serotina*), one-third natural size.

WOOLLY LOCO WEED.

Astragalus mollissimus Torr.

Other names: Loco weed; crazy weed. (Fig. 8.)

Description and where found.—A silvery-white, silky-leaved perennial 8 to 12 inches high, with an abundance of soft foliage springing out in a cluster from a short central stem close to the ground. The flowers are pea-shaped and usually purple. The pod is distinctly two-celled. This plant is native to the Great Plains region, extending from western Texas and New Mexico northward to South Dakota and Wyoming, being most abundant in Colorado and in the western part of Nebraska and Kansas. It grows both on the open prairie and on rocky hillsides.

How stock are affected.—Horses, cattle, and sheep are affected by loco, but the principal damage is done to horses. The effect is not acute, but in its slow progress simulates diseases caused by bacteria, worms, or other parasites or such as are caused in man by the continued use of alcohol, tobacco, or morphine. Two stages are recognized. The first, which may last several months, is a period of hallucination or

mania accompanied by defective eyesight, during which the animal may perform all sorts of antics. After acquiring a taste for the plant it refuses every other kind of food, and the second stage is ushered in. This is a lingering period of emaciation, characterized by sunken eyeballs, lusterless hair, and feeble movements. The animal dies as if from starvation, in periods ranging from a few months to one or two years.

Damage done.—The damage done to the live-stock business by this



FIG. 8.—Woolly loco weed (*Astragalus mollissimus*): *a*, whole plant; *b*, cross section of pod—both one-third natural size.



FIG. 9.—Stemless loco weed (*Aragallus lambertii*): *a*, flowering plant; *b*, seed pods; *c*, cross section of seed pod—all one-third natural size.

weed is immense. As mentioned in the introduction, the State of Colorado paid out nearly $200,000 in bounties between 1881 and 1885 in an attempt to exterminate it.

This genus contains a large number of species, and it is quite probable that many of these should be considered to be poisonous where they grow over wide areas of pasture land, and are green at periods when there is but little green grass. Over a half dozen have been reported to the Department of Agriculture as highly detrimental to the stock industry.

STEMLESS LOCO WEED.

Aragallus lambertii (Pursh) Greene.

Other names: Loco weed; crazy weed; Colorado loco vetch. (Fig. 9.)

Description and where found.—This differs from the true loco weed most conspicuously in its more erect and branchless habit, its longer leaflets, which are linear or oblong instead of ovate, and the one-celled seed pod. It ranges over the same territory as does the woolly loco weed, but extends farther, being found throughout the Great Plains from British America to Mexico, and it also ascends higher in the mountains, growing luxuriantly at Silver Cliff, in Colorado, at an altitude of about 8,000 feet.

Symptoms.—So far as has been observed, the symptoms of poisoning are identical with those produced by the preceding species. The two plants are considered to be equally prejudicial to the stock-raising interests of New Mexico.



FIG. 10.—Rattlebox (*Crotalaria sagittalis*): *a*, whole plant; *b*, cross section of seed pod—both one-third natural size.

RATTLEBOX.

Crotalaria sagittalis L.

Other names: Rattleweed; wild pea. (Fig. 10.)

Description and where found.—A hairy annual, 3 to 18 inches high, with simple undivided leaves, 1 to 2 inches long, and small, yellow pea-like flowers appearing in July. The seed pods are about an inch in length when mature, and are nearly black. They are much inflated, and as the walls are stiff and thin and very resonant, they make excellent miniature rattles when the seeds have become detached from their fastenings inside the pod. The rattlebox is native in low, sandy soils from the Atlantic westward to Minnesota and eastern Kansas; also in New Mexico. It is common in Connecticut, New Jersey, and North Carolina, and in some years is very abundant in bottom lands along the valley of the Missouri, in South Dakota and Iowa.

Poisonous character.—The poisonous constituent is unknown, but it resides both in the leaves and in the seeds. Horses, and sometimes cattle, are killed by eating grass or meadow hay mixed with the plant.

They are not poisoned so often by eating the plant in the field. Public attention was first called to the poisonous nature of rattlebox by Dr. Stalker, of Iowa, who in 1884, while investigating the cause of "bottom disease," then prevalent among horses in Iowa, was led to believe that it was mostly if not altogether attributable to this plant. Experiments were made which proved the supposition to be correct.

Symptoms.—As generally described from accidental cases, the symptoms are much prolonged, death resulting only after several weeks or months. There is a general decline of vigor, and a gradual loss of flesh as observed in the case of loco, with which this plant is closely related. The rattlebox does not, however, appear so often to produce the craziness characteristic of loco.

The percentage of rattlebox in meadow hay will be much reduced if the fields are burned over when the seeds mature the preceding summer. The growth of perennial grasses will not be materially affected thereby.



FIG. 11.—Caper spurge (*Euphorbia lathyris*): *a*, upper half of plant, one-third natural size; *b*, seed capsule, natural size.

CAPER SPURGE.

Euphorbia lathyris L.

Other names.—Garden spurge; myrtle spurge; mole plant; mole weed; mole tree; gopher plant; antigopher plant; wild caper; caper bush; wolf's milk; springwort. (Fig. 11.)

Description and where found.—A smooth herbaceous, milky-juiced perennial, 2 to 3 feet high, with a stiff, erect stem, and opposite, four-ranked leaves, the lower of which are thick and oblong, the upper thin, broad, and heart-shaped. The flowers are greenish-yellow and rather small. The three-seeded fruit is conspicuous. It is a common garden plant, sparingly introduced in wet ground in California and Texas, and in the Atlantic States from New Jersey to West Virginia and North Carolina.

Poisonous properties.—The fresh milky juice is exceedingly acrid and the fruit is highly purgative and poisonous. When used as a household remedy it often provokes serious trouble. Women and children are not infrequently poisoned by handling the plant and getting the juice on the face. Cattle are quite resistant to its influence, but they are sometimes overcome. Goats will eat the plant extensively if noth-

ing better presents itself, and it is said that their milk then possesses all of the venomous properties of the plant. When applied to the skin the juice causes redness, itching, pimples, and sometimes gangrene, the effect often lasting more than a week. The seed taken internally in overdose will inflame the mouth and stomach, and cause intense diarrhea and vomiting. If the dose is sufficient, there will be nervous disorders, unconsciousness, general collapse, and death.

SNOW ON THE MOUNTAIN.

Euphorbia marginata Pursh.

Description and where found.—An annual plant 2 to 4 feet high, differing most conspicuously from the preceding species in its more slender and less branching habit, and in having its upper leaves broadly margined with white. (Fig. 12.) Its general aspect is far more pleasing to the eye, and on this account it is more frequently gathered for decorative purposes. This spurge is a native weed of the Great Plains from Montana to Mexico, and is spreading eastward rapidly to Louisiana and through southern Minnesota and Missouri to Wisconsin, Illinois, and Indiana. It is cultivated considerably for ornament, especially in the Northern Atlantic States, where it has frequently escaped from cultivation. It has recently been introduced as a weed into Germany.

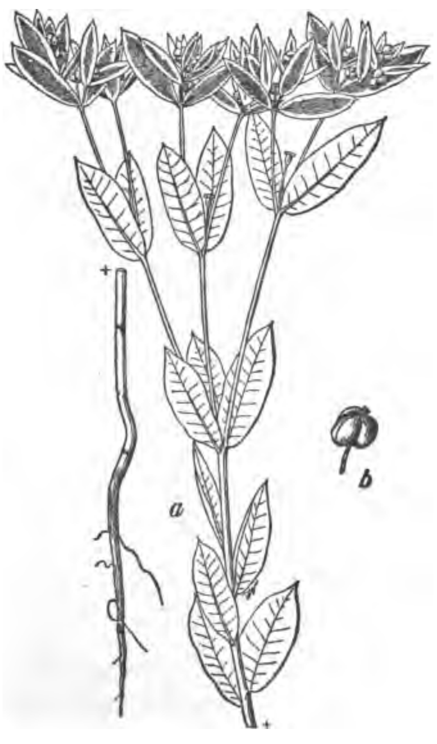


Fig. 12.—Snow on the mountain (*Euphorbia marginata*): *a*, whole plant, one-third natural size; *b*, seed capsule, natural size.

Poisonous property.—The poison of this plant reaches the stomach so far as known only through the eating of honey derived from its flowers. Large quantities of fall honey are annually made unsalable in localities where the plant grows in great abundance. The honey is hot and disagreeable to the taste, but does not appear to be a very serious poison, its effects being confined mostly to vomiting and purging. The milky juice, when it gets on the skin, very often causes an itching inflammation, accompanied by pimples and blisters which last for several days. The general effect is much like that observed in rhus poisoning, for which it is sometimes mistaken. This blistering

action is, in fact, so decided that a few stock raisers in Texas use the juice to brand cattle, it being held by them to be superior to a red-hot iron for that purpose, because the scar heals more satisfactorily.

POISON IVY.

Rhus radicans L.

Other names: Poison oak; poison vine; three-leaved ivy; poison creeper; mercury or markry (N. H. and N. J.); black mercury (Me.); markweed (Me.); pickry (Me.). (Fig. 13.)

Description and where found.—A climbing or trailing shrub (sometimes erect), with variable three-foliate leaves, aerial rootlets, and greenish flowers, appearing in May and June. The smooth, waxy, white fruit often remains on the plant until late in winter. The leaves often resemble those of the box elder, as in the figure. They differ from those of the Virginia creeper in having only three leaflets instead of five. Poison ivy grows everywhere in open brush, in ravines, and on the borders of woods, and it is spread along roadsides and cultivated fields from seeds carried by crows, woodpeckers, and other birds that feed upon its fruit in winter. Through ignorance or carelessness, and at the imminent risk of causing great bodily discomfort to many persons, this vine is sometimes planted about suburban and even city residences for the sake of ornament. It occurs wild in abundance throughout the United States as far west as eastern Texas, eastern Kansas, and Minnesota, and in greater or less abundance throughout the less arid region of the West, with the exception of California and the western parts of Oregon and Washington, where it appears to be entirely replaced by *Rhus diversiloba.*



Fig. 13.—Poison ivy (*Rhus radicans*): *a*, spray showing aerial rootlets and leaves; *b*, fruit—both one-fourth natural size.

Poisonous character.—Recent experiments made by Dr. Franz Pfaff, of the Harvard University Medical School, have shown that the poison is a nonvolatile oil. It is found in all parts of the plant, even in the wood

after long drying. Like all oils, it is insoluble in water, and can not therefore be washed off the skin with water alone. It is readily removed by alcohol, and very easily destroyed, as Pfaff has shown, by an alcoholic solution of sugar of lead (lead acetate).

Effect of the poison.—Numerous experiments show conclusively that the oil produces precisely the same effect as does the plant itself. When a very minute amount is placed upon the skin, it is gradually absorbed in the course of a day or so, and within certain limits the effect is proportional to the time of contact. In an experiment performed by the writer, the oil was applied to four places on the left wrist, and these were carefully guarded to prevent spreading. At the end of an hour one of the spots was thoroughly washed by successive applications of alcohol; in three hours the oil from a second was washed off in the same manner, and the others were cleansed three hours later. There was little or no effect on the first; that on the second was more marked, but did not equal that produced on the last two, which was about the same in each. The spots were within an inch of each other, but remained wholly distinct, a fact which very clearly shows that the affection is not spread by the blood. Subsequent applications of an alcoholic solution of sugar of lead gave speedy and permanent relief.

Remedies.—In practice it is not desirable to use strong alcohol, which is apt to be too irritating to a sensitive surface, but a weaker grade of from 50 to 75 per cent is recommended. To this the powdered sugar of lead is to be added until no more will easily dissolve. The milky fluid should then be well rubbed into the affected skin, and the operation repeated several times during the course of a few days. The itching is at once relieved and the further spread of the eruption is checked. The remedy has been tried in a large number of cases and has always proved successful. It must be remembered, however, that the lead solution is itself very poisonous if taken internally.

Restrictive and preventive measures.—It is highly desirable that legal measures be adopted compelling the destruction of these plants where they abound in cities and in places of popular resort. This can be managed without much danger from the poison, and is a matter of very general public interest. As has already been noted, many individuals are practically immune from the effects of poison ivy. Advantage should be taken of this fact to employ such individuals to remove these plants from the vicinity of dwellings and from playgrounds. Much of the work would be purely mechanical, consisting in rooting the plants up by main force. This is the most certain method; the use of concentrated sulphuric acid is attended with less danger, as the plants do not need to be touched. A half teaspoonful should be applied to the stem every two or three weeks in the springtime when the plant is growing most vigorously. Care should be taken to keep the acid away from the skin, as it is most highly corrosive. The brush should in no case be left upon the ground nor the wood used for fuel. In burning the refuse in

the field, pains should be taken not to inhale the smoke nor to handle the wood any more than necessary.

The greatest care should be exercised in preventing workmen from transferring the oil from their clothes and hands to other individuals. To accomplish this object special suits should be worn, and the hands should be washed several times a day with the alcoholic sugar of lead solution described above. Bathing in hot water with strong soapsuds is recommended. The clothing must also be well washed, and it is always well to remember that towels may be a means of conveying the oil.

POISON OAK.

Rhus diversiloba Torr. & Gr.

Other names: Poison ivy; yeara; California poison sumac. (Fig. 14.)

Description and where found.—The poison oak differs from the preceding species mainly in the character of its leaflets, which are somewhat thicker and smaller, more nearly elliptical, and less sharply lobed. Their similarity to the leaves of the Western oaks gives the plant its common name. The poison oak grows at low elevations in open woods, on bushy hillsides and ravines, and sometimes along fences, in Arizona and to the west of the Sierra Nevada and Cascade ranges in California, Oregon, and Washington. It does not, however, frequent the higher mountains.



FIG. 14.—Poison oak (*Rhus diversiloba*), showing leaves, flowers, and fruit, one-third natural size.

Poisonous character and remedy.—This species produces about the same effect on the human skin as the poison ivy, and cases of poisoning are to be treated in the same way.

POISON SUMAC.

Rhus vernix L.

Other names: Swamp sumac; dogwood (Mass.); poison dogwood; poison elder (Ala.); poison ash (Vt.); poison tree; poison wood; poison swamp sumac; thunderwood (Ga., Va.). (Fig. 15.)

Description and where found.—A tree-like shrub 6 to 30 feet high, with long pinnate leaves having from 7 to 13 leaflets, without marginal teeth. The wood has a faint sulphurous odor, which, together with the leaf scars, which are very prominent, enables one to distinguish the

plant from other shrubbery in winter. It grows in swamps and in damp woods from Florida to Canada and westward to Louisiana.

Poisonous character.—This also affects the skin in the same way as poison ivy, and cases require the same remedy.



FIG. 15.—Poison sumac (*Rhus vernix*), showing leaves, fruit, and leaf-scars, one-fourth natural size.

RED BUCKEYE.

Aesculus pavia L.

Other names: Small buckeye; buckeye; horse-chestnut.

Description and where found.—A shrub 8 to 12 feet high, with opposite long-stemmed leaves, and numerous clusters of bright red flowers, which appear in March. The fruit is smooth, even when young; the seeds are mahogany-colored and are elegantly polished. The red buckeye is native in fertile valleys from Virginia to Florida, throughout the Gulf States to Louisiana, and in Arkansas. It is sparingly represented in Missouri, Tennessee, Kentucky, and West Virginia. It is cultivated to some extent in Pennsylvania.

Poisonous character.—The records of its poisonous action are mostly confined to its use as a means of procuring fish, but cattle are sometimes killed by eating the fruit. It was formerly, and perhaps is still, the practice to stir the bruised seeds or twigs into small ponds and gather the stupefied fish by hand as they rise to the surface. When thoroughly cooked these fish are quite wholesome.

Other species.—The common horse-chestnut (*Aesculus hippocastanum*) is poisonous. In England, however, it is fed to cattle after the removal of the poison by thorough washing with alkali. Cases of poisoning by this and the next species have arisen from overdoses in medicine. The Ohio buckeye (*Aesculus glabra*) is regarded as intermediate between the above species in its poisonous qualities. The fruit of the California buckeye (*Aesculus californica*) is sometimes made into soup and bread

by the Round Valley Indians, after removing the poison by roasting and leaching.

WATER HEMLOCK.

Cicuta maculata L.

Other names: American water hemlock; wild hemlock; spotted hemlock; spotted parsley; snakeweed; beaver poison; musquash root; muskrat weed; cowbane; spotted cowbane; children's bane; death of man. (Fig. 16.)

Description and where found.—A smooth, erect, perennial, 3 to 8 feet high, with a rigid, hollow stem, numerous branches, finely dissected leaves, white flowers, and a cluster of spindle-shaped roots, which vary in length from 1½ to 3 inches, and are very characteristic of the plant. It grows commonly in swamps and damp soil, throughout the Atlantic States, westward to Louisiana, Iowa, and Minnesota; much less commonly northwestward through Nebraska to the Rocky Mountains, and in New Mexico.



FIG. 16.—Water hemlock (*Cicuta maculata*), showing section of spindle-shaped root and lower stem, the leaves, flowers, and fruit one-half natural size; also fruit and cross section of seed, enlarged five times.

Poisonous property.—This is one of the most poisonous native plants in the United States, being rapidly fatal to both man and animals. The roots are especially dangerous, because the taste, being aromatic and to some people suggesting that of horse-radish, parsnips, artichokes, or sweet cicely, is apt to lead children to eat them when they are found forced out of the soil by washing, freezing, or other causes in early spring. Cattle sometimes eat the tubers, and in marshes they are poisoned by drinking water contaminated by the juice of roots which have been crushed by being trampled upon. No estimate can be made of the amount of damage done to live stock, but it is very considerable. The human victims average several per annum. In the State of New Jersey alone, as mentioned in the introduction, two quadruple cases were reported during the spring of 1896, which resulted in the death of two individuals.

Symptoms.—The prominent symptoms are vomiting, colicky pains, staggering, unconsciousness, and frightful convulsions, ending in death.

OREGON WATER HEMLOCK.

Cicuta vagans Greene.

Other names: Water hemlock; cicuta. (Fig. 17.)

Description and where found.—A smooth perennial, with erect or straggling glaucous stems 3 to 6 feet high, compound leaves, which spring directly from the ground, white flowers, blooming in July and August, and a fleshy root, which has a muskrat-like odor, and which consists of two very distinct and characteristic parts. The more conspicuous of these is the vertical rootstock, which is from 1 to 6 inches long by 1 or 2 thick, and is curiously divided into numerous chambers by horizontal partitions. This rootstock furnishes the bulk of the poison. The other portion of the root consists of solid, fleshy fibers, which run along on or just under the surface of the soil, and send off numerous rootlets from beneath. The rootstock rots or dwindles away almost entirely before the seeds mature, but fresh ones are formed from it for the next season's growth. The plant grows in wet or marshy places, and ranges from British Columbia and Idaho southward to northeastern California, and perhaps to the southern Sierra Nevada.



FIG. 17.—Oregon water hemlock (*Cicuta vagans*). *a*, plant with leaves, one-sixth natural size; *b*, rootstock and horizontal roots; *b'*, section of rootstock, half size; *c*, terminal leaflets, one-sixth natural size; *d*, flowering spray, full size.

Cases of poisoning.—Cases of cattle poisoning have been reported from Victoria, British Columbia; Colby, Wash.; from various parts of Oregon, and from northern California. Prof. U. P. Hedrick, of Corvallis, Oreg., who has investigated cases of poisoning from this plant, believes that more than one hundred cattle are killed by it every year in Oregon. A piece of the winter rootstock the size of a walnut was found to be fatal to a cow. A piece the size of a marble is looked upon as dangerous to man. Human cases are not numerous, but a few have been reported in which individuals nibbled at the root through curiosity.

The Oregon water hemlock has often been mistaken for the preceding species, and also for *Cicuta virosa* L., but neither of these occur in

the far Northwestern States. Some other plants that are mistaken for it are the so-called "wild celery" (*Oenanthe sarmentosa*), Oregon sweet cicely (*Glycosma ambigua*), and poison hemlock (*Conium maculatum*). These are all easily distinguished by the root, which in no case resembles the one here figured.

When these plants occupy large areas, the only safeguard for cattle is to keep them on other pastures, especially when they are hungry. The plants may be destroyed by hand pulling when they occur in small quantities near dwellings or playgrounds.

POISON HEMLOCK.

Conium maculatum L.

Other names: Hemlock; wild hemlock; spotted parsley; stinkweed; herb bennet; poison root; poison snakeweed; cashes; wodewhistle. (Fig. 18.)



FIG. 18.—Poison hemlock (*Conium maculatum*), showing upper portion of plant, with flowers and seed, one-third natural size.

Description and where found.—A smooth, purple-spotted, hollow-stemmed biennial, 2 to 7 feet high, with large parsley-like leaves and showy clusters of small white flowers, which appear in July and August. The seed is prominently ridged, and has on its inner surface a deep, narrow, longitudinal groove. The fresh leaves have an extremely nauseating taste, and when bruised emit a characteristic mouse-like odor. Poison hemlock is native to Europe and Asia, but has become naturalized in the United States, and is rather common on waysides and in waste places in New York, West Virginia, Pennsylvania, New Jersey, and Ohio, and not rare in the New England States and in Michigan. It is infrequent in Wisconsin, Illinois, Louisiana, and California, but in some localities in the latter State it has a very rank growth.

Character of the poison.—The characteristic poison of the hemlock is the well-known volatile alkaloid, conine, which is found in the seeds, and, especially at flowering time, in the leaves. The root is nearly harmless in March, April, and May, but is dangerous afterwards, especially during the first year of its growth. The poison hemlock is the most generally known poisonous plant historically, it being without much doubt the plant administered by the Greeks to Socrates and

other state prisoners. Recent cases of poisoning have arisen accidentally from eating the seed for that of anise, the leaves for parsley, or the roots for parsnips; also from blowing whistles made from the hollow stems. It has recently been shown that some of the anise seed in both foreign and domestic markets is contaminated with hemlock seeds, but it is not known whether serious consequences have resulted therefrom.

Symptoms.—The symptoms in man are such as are due to a general and gradual weakening of muscular power. The power of sight is often lost, but the mind usually remains clear until death ensues, as it soon does from the gradual paralysis of the lungs. The poisoning differs from that of the water hemlock (*Cicuta maculata*) in the absence of convulsions. Many domestic animals have been killed by eating the plant, the prominent symptoms described for cows being loss of appetite, salivation, bloating, much bodily pain, loss of muscular power, and rapid, feeble pulse.

As this plant does not often occur in great quantity in the United States, it may usually be destroyed by hand pulling before maturity.

BROAD-LEAF LAUREL.

Kalmia latifolia L.

Other names: Laurel (north of Md.); ivy (south of Md.); mountain laurel; sheep laurel; poison laurel; wood laurel; small laurel; rose laurel; high laurel; American laurel; poison ivy; ivy bush; ivy wood; big ivy; calico bush; spoonwood; kalmia; wicky. (Fig. 19.)

Description and where found.—A fine shrub, usually 4 to 8, but sometimes 30 to 40 feet high. It has thick, flat, and shining leaves, showy clusters of peculiarly shaped, viscid, and mostly inodorous pink flowers, which appear in May and June, and a globular, viscid, dry, and inedible fruit. It grows abundantly on rocky hillsides, in cattle ranges, and on mountain slopes up to 3,000 or 4,000 feet, from Connecticut to eastern Ohio and along the Alleghenies to Georgia and Alabama; less abundantly in the New England and Southern States as far as Louisiana and Arkansas.

Ways of poisoning.—Scores of cattle and sheep are poisoned annually by eating the shrub. Access to it is generally obtained by breaking away from inclosures, or through neglect or accident when cattle or sheep are being driven past laurel thickets to upland pastures in early spring. Laurel leaves (commonly used for decorative purposes in winter), or the flowering branches, are often carelessly thrown into inclosures where animals are kept. The older cattle are not so frequently killed by it, but they are by no means immune. Horses and even goats have died from eating the leaves.

It is stated that chickens have been poisoned by eating the vomited matter from poisoned animals. Experiments show, however, that they are able to withstand considerable quantities of the pure poison when

it is fed to them. In these experiments the chickens were killed with chloroform after dosing for a few days. The entrails were then cast aside, and the well-boiled and well-cleansed meat was fed to cats with nearly fatal results.

The honey derived from the nectar of the flower appears to be poisonous under some conditions. Cases of human poisoning occur indirectly in the ways indicated above; directly by overdoses, or improper use in domestic medicine, probably by the secret and criminal use of the leaves to increase the intoxicating effects of liquors, and, in children, by their eating the young shoots by mistake for the wintergreen (*Gaultheria procumbens*).



FIG. 19.—Broad-leaf laurel (*Kalmia latifolia*): *a*, flowering spray, one-third natural size; *b*, vertical section of flower showing peculiar attachment of stamens, natural size; *c*, fruiting capsules, natural size.

Symptoms.—The general symptoms in sheep may be taken as representative for those in cows and goats. They are as follows: Persistent nausea, with slight but long-continued vomiting and attempts to vomit, frothing at mouth, grating of teeth, irregular breathing, partial or complete loss of sight and feeling, dizziness, inability to stand, extreme drowsiness, stupor, and death. The irregularity of the respiration is most characteristic, being present throughout the main part of the attack. In addition to most of the above effects there is, in man, severe pain in the head, an increased tendency to perspire, and often a peculiar tingling sensation in the skin throughout the entire body. Vomiting is very copiously produced, and consequently the effects are generally less severe than in animals.

The broad-leaf laurel is typical in its effects of a half dozen or more native species of the heath family. They are all poisonous in the same way, because they all contain the same toxic or poisonous substance, known as andromedotoxin. Many fatalities among animals are recorded against the four species whose descriptions follow.

NARROW-LEAF LAUREL.

Kalmia angustifolia L.

Other names: Sheep laurel; lambkill; sheep poison; lamb laurel; dwarf sheep laurel; small laurel; low laurel; dwarf laurel; wicky.

Description and where found.—Like the preceding, but smaller, only 2

to 4 feet high, with smaller, thinner, and narrower leaves, and smaller flowers, clustered, not at the extreme end of the stem, but at the base of the fresh shoots. It is abundant at low altitudes in both dry and wet soils from Maine to New Jersey; less abundant westward throughout the Great Lakes region and southward to Tennessee and South Carolina.

GREAT LAUREL.

Rhododendron maximum L.

Other names: Laurel (south of Pa.); rosebay; mountain laurel; rhododendron; American rosebay; big laurel (Pa.); big-leaf laurel (Pa.); horse laurel (Pa.); deer tongue; cow plant (Vt.); spoon hutch (N. H.).



FIG. 20.—Staggerbush (*Pieris mariana*), showing flowering branch, one-third natural size.



FIG. 21.—Branch ivy (*Leucothöe catesbaei*): *a*, flowering branch; *b*, fruiting capsules—both one-third natural size.

Description and where found.—A large evergreen bush or small tree, 10 to 20 or 30 feet high, with thick leaves, 4 to 10 inches long, and splendid clusters of large, inodorous, pale pink, or nearly white flowers, blossoming in July. A commonly cultivated ornamental tree, native to the Allegheny Mountains, but extending northward in isolated patches to Connecticut and New Hampshire.

STAGGERBUSH.

Pieris mariana (L.) Benth. & Hook.

Other name: Kill lamb. (Fig. 20.)

Description and where found.—A weak-limbed deciduous shrub, 2 to 4 feet high, with thick conspicuously veined leaves and showy clusters of tubular white flowers. It is frequent in low, damp soils near the coast from Connecticut to Florida.

BRANCH IVY.

Leucothöe catesbaei (Walt.) A. Gray.

Other names: Hemlock; calf kill; leucothöe; dog laurel. (Fig. 21.)

Description and where found.—An evergreen shrub, 2 to 4 feet high, with thick, tapering, sharply saw-edged leaves and numerous clusters of small, white, tubular, ill-smelling flowers, which appear in April or May. It grows abundantly, often forming dense thickets along stream banks in the Allegheny Mountains from West Virginia to northern Georgia.

JIMSON WEED.

Datura stramonium L.

Other names: Jamestown weed; common stramonium; thorn apple; apple of Peru; devil's apple; mad apple; stinkwort; stinkweed (W. Va.); Jamestown lily (N.C.); white man's plant (by Indians). (Fig. 22.)

Description and where found.—The jimson weeds are rank ill-smelling plants, with large funnel-shaped flowers and prickly four-valved seed pods. They are mostly weeds which have been introduced into the United States from Europe and tropical America. The present species is a stout, smooth, bushy annual 2 to 5 feet high, with a coarse green stem, large flaccid leaves, and white, heavy-scented flowers 2 to 4 inches long. The flowers appear from May to September, and the fruit ripens from August to November, according to latitude. The seeds are numerous and about the size of a grain of buckwheat. When fresh they are ill-scented and nauseating, but later they are not so disagreeable. The nectar is sweet, but a little nauseating. The jimson weed is native to Europe and Asia, but is now commonly introduced in waste grounds about dwellings in all of the States east of Iowa and Louisiana with, perhaps, the exception of Minnesota. It is common in eastern Kansas and Nebraska, and in some parts of Colorado, and has probably obtained some foothold in all of the Western States.

The purple-stemmed jimson weed (*Datura tatula*) is a somewhat taller plant, with purplish flowers and stems, but otherwise practically identical with the preceding, both in botanical and toxic characters. It is more abundant toward the South and West than the other.

Ways of poisoning.—Cases of poisoning arise in adults from excessive use as a stimulant or as a medicine. Children are sometimes tempted

to eat the fruit if they are permitted to play where the weed is to be found. Several cases of this kind were reported to this Department during the fall of 1897. At Alpena, Mich., five children were badly poisoned in August by eating the seeds of the purple-flowered species, which was cultivated in a garden as a curiosity under the fanciful trade name of "Night-blooming Cactus." Several other cases where children have been poisoned by this plant have been reported. Children are also poisoned by sucking the flower or playing with it in the mouth. The fresh green leaves and also the root have occasionally been cooked by mistake for other wild edible plants. One or two instances are recorded in which cattle have been poisoned by eating the leaves of young plants which were present in grass hay.



FIG. 22.—Jimson weed (*Datura stramonium*): *a*, flowering spray; *b*, fruiting capsule—both one-third natural size.

Symptoms.—The symptoms of the poisoning are headache, vertigo, nausea, extreme thirst, dry, burning skin, and general nervous confusion, with dilated pupils, loss of sight and of voluntary motion, and sometimes mania, convulsions, and death.

The jimson weeds should be removed from vacant lots by mowing the plants while in flower or by cultivating the soil.

BLACK NIGHTSHADE.

Solanum nigrum L.

Other names: Common nightshade; nightshade; deadly nightshade; garden nightshade. (Fig. 23.)

Description and where found.—The black nightshade is a smooth annual, 1 to 2 feet high, with rough, angular, widely branching stems; ovate leaves, 2 to 4 inches long, with wavy margins; drooping clusters of small white flowers, and black, globose, juicy berries, which ripen from July to October. It is a common introduced weed in rich shaded grounds and fields east of South Dakota and Arkansas, and in damp places westward to the Pacific Ocean.

Poisonous properties.—The amount of poison present in any part of this plant varies with the conditions of growth. The more musky-odored plants are the most poisonous. In some the amount of alkaloid in the ripe fruit and leaves is so small that these parts may be, and are, con-

sumed in considerable quantity without any ill consequences. Poisoning does sometimes follow, but it is not clear whether this is due to improper preparation or to careless selection of the parts used. The use of black nightshade for food is certainly not to be recommended. Cases of poisoning are recorded for calves, sheep, goats, and swine.

Symptoms.—The characteristic symptoms are about the same in man and animals. They are stupefaction, staggering, loss of speech, feeling and consciousness; cramps, and sometimes convulsions. The pupil of the eye is generally dilated. Death is directly due to a paralysis of the lungs, but fortunately few cases are fatal.



FIG. 23.—Black nightshade (*Solanum nigrum*), one-third natural size.

Nearly related to this plant is the spreading nightshade or "wild potato" (*Solanum triflorum* Nutt.), a native garden weed of the Great Plains region. It is a smooth, low annual, with widely branching stems, 7 to 9 lobed leaves, numerous clusters of small white flowers which are grouped in threes, and large green berries a half inch or more in diameter. These are not attractive to the eye, but have an agreeable odor and taste.

Complaints of the poisoning of cattle by this plant have been sent in to the Department from Nebraska, and experiments show that the berries are poisonous. No cases of human poisoning have been reported.

The plants of either of these species may easily be killed by cutting them down before the fruit matures.

BITTERSWEET.

Solanum dulcamara L.

Other names: Woody nightshade; nightshade vine; staff vine; fever twig; tetonwort.

Description and where found.—A climbing, woody, introduced perennial 3 to 6 or 8 feet high, with thin leaves, the lowermost of which are ovate or heart-shaped, the upper more or less spear-shaped. The flowers are purple, the fruit red. It ripens from July to October and November. The plant thrives best and is common along brooks and ditches from Massachusetts to Ohio, less common elsewhere in damp ground from Maine to North Carolina and to Wisconsin and Missouri.

Poisonous property.—The berry, though its taste is not remarkably disagreeable, is somewhat poisonous, and it has been shown that an extract of the leaves is moderately so.

SNEEZEWEED.

Helenium autumnale L.

Other names: Sneezewort; autumn sneezewort; autumn sneezeweed; staggerweed (S. C.); swamp sunflower; false sunflower. (Fig. 24.)



FIG. 24.—Sneezeweed (*Helenium autumnale*), one-third natural size.

Description and where found.—A smooth, angular, branching perennial, 1 to 3 feet high, with rather thick lance-shaped leaves, and a large number of showy yellow flowers which do not appear until autumn. It grows commonly in moist ground from Connecticut to Michigan and Illinois, and southward to the Gulf; less commonly northwestward from Louisiana to Oregon and Washington; also in Arizona. It has been found at an altitude of 6,000 feet in Nevada.

Poisonous character.—The whole plant, especially the flower, is bitter and more or less acrid and pungent. The powdered plant causes violent sneezing when inhaled, and it is therefore used in medicine to produce that effect. Sheep, cattle, and horses that are unfamiliar with the plant are often poisoned by it when driven to localities where it abounds. As a rule these animals avoid it, but it is claimed that they sometimes develop a taste for it and are killed by eating it in large quantity. The poison exists principally in the flowers. The young plants appear to be only very slightly dangerous; in the mature ones the amount of poison varies greatly even in the same field.

Symptoms.—The symptoms, as determined by experiments made in Mississippi upon calves, are an accelerated pulse, difficult breathing, staggering, and extreme sensitiveness to the touch. In fatal cases, death is preceded by spasms and convulsions.

Sneezeweed may be best kept in check by cultivating the ground or by mowing the plants down before the time of flowering.